Bryological Note

Invasion by *Bryum bornholmense* Winkelm. & Ruthe of heathland treated with calcium carbonate

While conducting a fertilizer experiment on part of Hazeley Heath in north Hampshire I noticed that a species of *Bryum* was invading six 0·5 m.^{2} plots that had been treated with powdered calcium carbonate (250 g. per plot per year). The invader was kindly identified by Dr E. V. Watson as *Bryum bornholmense* Winkelm. & Ruthe. I first noted this species in 1964, a year after the experiment began. By August 1965, however, it was the most abundant moss in all six calcium carbonate plots, with a mean density of 680 shoots/dm.^{2}. I searched 12 m.^{2} of surrounding untreated ground very carefully, but found only one small tuft of eight *B. bornholmense* shoots!

The topsoil on the heath was a layer of mor humus, and the pH of the top centimetre of this was 3·7–3·8. However, the mean pH of the top centimetre of soil in the calcium carbonate plots had increased to 7·8, equal to that under chalk grassland for example. I infer that the remarkable invasion of *B. bornholmense* resulted either directly or indirectly from the increase in soil pH. It cannot have been caused by the increase of calcium in the soil, because there was no invasion of six other plots that were treated with calcium sulphate, or of six plots that were treated with calcium dihydrogen phosphate. Dr Watson (personal communication) says he has found *B. bornholmense* growing well on burnt heathland. This accords with my findings, because burning releases bases from the litter and standing vegetation, thus causing an increase in soil pH (Haines, 1926; Allen, 1964). Whatever the reason for the spread of *B. bornholmense* though, it is clear that it is uncommon on the untreated heath, and probably grows at the limits of its tolerance, though this is said to be wide. Crundwell & Nyholm (1964) say '*B. bornholmense* is known from a wide variety of habitats and grows on peaty, sandy and loamy soils, ranging from the very acid to the highly calcareous'.

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REFERENCES

Allen, S. E. (1964). Chemical aspects of heather burning. *J. appl. Ecol.* **1**, 347–67.
Crundwell, A. C. & Nyholm, E. (1964). The European species of the *Bryum erythrocarpum* complex. *Trans. Br. bryol. Soc.* **4**, 597–637.
Haines, F. M. (1926). A soil survey of Hindhead Common. *J. Ecol.* **14**, 33–71.